HAND-HELD DEVICES II

Software Configuration Manual

DATALOGIC

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SOFTWARE CONFIGURATION MANUAL

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Hand-Held Devices II

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CONFIGURATION METHODS

Reading Configuration Barcodes

If you wish to change the default settings, this manual provides complete configuration of your reader in an easy way:

To configure your reader:

1) Open the folded page in Appendix C with the hex-numeric table and keep it open during the device configuration.

2) Read the **Enter Configuration** code ONCE, available at the top of each page of configuration.

3) Modify the desired parameters in one or more sections following the procedures given for each group.

4) Read the **Exit and Save Configuration** code ONCE, available at the top of each page of configuration.

Reference notes describing the operation of the more complex parameters are given in chapter 4.

Using DL Sm@rtSet

DL Sm@rtSet is a Windows-based utility program providing a quick and user-friendly configuration method via the RS232 or USB-COM interfaces.

It also allows upgrading the software of the connected device (see the DL Sm@rtSet User's Manual for more details).

Copy Command

A previously configured reader (Master device), can be used to send its configuration directly to other readers of the same type. The particular procedure for each device is given in par. 4.8.

Sending Configuration Strings from Host

An alternative configuration method is provided in Appendix A using the RS232 or USB interfaces. This method is particularly useful when many devices need to be configured with the same settings. Batch files containing the desired parameter settings can be prepared to configure devices quickly and easily.

1 INTRODUCTION

This manual provides all the necessary information for complete software configuration of various Datalogic families of second generation Hand-Held Devices (**HHD II**), including CCD guns and readers and laser scanners.

Your reader contains a built-in decoder and multi-standard interface.

It is designed for use in a wide variety of applications and environments including **commercial**, **office automation**, **retail**, and **light industrial** applications where large quantities of information need to be collected rapidly, easily and reliably.

It has several status indicator functions which are described in the next paragraph.

1.1 STATUS INDICATORS

Several status indicators are available depending on the type of reader: LEDs, Beeper, and Good Read Spot (for CCD Long Range readers only). They signal several operating conditions which are described in the tables below.

H = high tone **L** = low tone

READER START-UP

Beeper[1]	Meaning
L L L L	Parameters loaded correctly
H H H H long tones	Parameter loading error, reading or writing error in the non volatile memory
H L H L	Hardware error in EEPROM
OFF	No beeper performed when illuminator line is kept high at power on.

READER CONFIGURATION

Beeper[1]	Meaning
H H H H	correct entry in Configuration mode
L	good read of a command
L L L	command read error
L H H H H	exit from Configuration mode

READER DATA ENTRY

Beeper[1]	LED	Good Read Spot	Meaning
one beep[2]	ON	ON	correct read of a code in normal mode
	OFF	OFF	ready to read a code

[1] only the Beeper Intensity command can modify these signals.

[2] the data entry good read tone is user-configurable with all the Beeper commands in the Reading Parameters section.

2 INITIAL SETUP

2.1 RESTORE DEFAULT

Read the restore default parameters code below.

Restore Default

2.2 INTERFACE SELECTION

Read the interface selection code for your application.

RS232

Standard

POS Systems

Nixdorf Mode A

Fujitsu

ICL Mode

For POS system default settings refer to par. 4.9

USB

USB-KBD

USB-KBD-ALT-MODE

USB-KBD-APPLE

USB-COM*

USB-IBM-Table Top

USB-IBM-Hand Held

* When configuring USB-COM, the relevant files and drivers must be installed from the USB Device Installation software which can be downloaded from the web page (see http://www.datalogic.com/services/support/).

For details about the start-up of USB devices refer to par. 4.10.

WEDGE

IBM AT or PS/2 PCs

IBM XT

PC Notebook

IBM SURE1

IBM Terminal 3153

WEDGE (continued)

IBM Terminals 31xx, 32xx, 34xx, 37xx:

To select the interface for these IBM Terminals, read the correct KEY TRANSMISSION code. Select the KEYBOARD TYPE if necessary (default = advanced keyboard).

KEY TRANSMISSION MODE

make-only keyboard

make-break keyboard

KEYBOARD TYPE

◆ advanced keyboard

typewriter keyboard

WEDGE (continued)

ALT MODE

The ALT-mode selection allows barcodes sent to the PC to be interpreted correctly independently from the Keyboard Nationality used. **You do not need to make a Keyboard Nationality selection.**

(default = Num Lock Unchanged). **Make sure the Num Lock key on your keyboard is ON.**

IBM AT - ALT mode

PC Notebook - ALT mode

WYSE TERMINALS

ANSI Keyboard

PC Keyboard

ASCII Keyboard

VT220 style Keyboard

WEDGE (continued)

DIGITAL TERMINALS

VT2xx/VT3xx/VT4xx

APPLE

APPLE ADB Bus

PEN

IBM Terminals 46xx

(IBM Devices only)

PORT 9B

4501 Protocol

(typical)

1520 Protocol

PORT 5B

1520 Protocol

(typical)

4501 Protocol

YOUR READER IS NOW READY TO READ BARCODES.

To change the defaults see Chapter 3.

3 CONFIGURATION

Once your reader is setup, you can change the default parameters to meet your application needs. Refer to chapter 2 for initial configuration in order to set the default values and select the interface for your application.

In this manual, the configuration parameters are divided into logical groups making it easy to find the desired function based on its reference group.

The first four groups are for Standard Interface parameter configuration:

- **RS232**
- **USB**
- **WEDGE**
- **PEN EMULATION**

The following parameter groups are common to all interface applications:

DATA FORMAT parameters regard the messages sent to the Host system for all interfaces except Pen Emulation.

POWER SAVE manages overall current consumption in the reading device.

READING PARAMETERS control various operating modes and indicator status functioning.

DECODING PARAMETERS maintain correct barcode decoding in certain special reading conditions.

CODE SELECTION parameters allow configuration of a personalized mix of codes, code families and their options.

ADVANCED FORMATTING PARAMETERS allow code concatenation and advanced formatting of messages towards the Host. It cannot be used with Pen Emulation.

RS232 PARAMETERS

⊙	***BAUD RATE***	⊙
⊙	***PARITY***	⊙
⊙	***DATA BITS***	⊙
⊙	***STOP BITS***	⊙
⊙	***HANDSHAKING***	⊙
⊙	***ACK/NACK PROTOCOL***	⊙
⊙	***FIFO***	⊙
⊙	***INTER-CHARACTER DELAY***	⊙
⊙	***RX TIMEOUT***	⊙
⊙	***SERIAL TRIGGER LOCK***	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

BAUD RATE

300 baud

600 baud

1200 baud

2400 baud

4800 baud

◆ 9600 baud

19200 baud

38400 baud

PARITY

◆ none

even parity

odd parity

DATA BITS

7 bits

◆ 8 bits

9 bits

STOP BITS

◆ 1 stop bit

2 stop bits

HANDSHAKING

◆ disable

hardware (RTS/CTS)

software (XON/XOFF)

RTS always ON

See par. 4.1.1 for details.

ACK/NACK PROTOCOL

◆ disable

enable

See par. 4.1.2 for details.

FIFO

disable

◆ enable

See par. 4.1.3 for details.

INTER-CHARACTER DELAY

delay between characters transmitted to Host

Read 2 numbers from the table where:
00 = DELAY disabled
01-99 = DELAY from **1** to **99** milliseconds

◆ delay disabled

RX TIMEOUT

timeout control in reception from Host

Read 2 numbers from the table where:
00 = TIMEOUT disabled
01-99 = TIMEOUT from **.1** to **9.9** seconds

◆ rx timeout 5 seconds

See par. 4.1.4 for details.

SERIAL TRIGGER LOCK

◆ disabled

enabled

Read 2 characters from the Hex/Numeric table in the range 00-FE where:

- First Character enables device trigger
- Second Character inhibits device trigger until the first character is received again.

USB PARAMETERS

⊙ ***USB-COM*** ⊙

Handshaking, Ack/Nack protocol, FIFO, Inter-character delay, Rx timeout, Serial trigger lock

⊙ ***USB-KBD*** ⊙

Keyboard nationality, Inter-character delay, Inter-code delay, Control character emulation

⊙ ***USB-IBM*** ⊙

No parameter selection required.

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

HANDSHAKING

◆ disable

hardware (RTS/CTS)

software (XON/XOFF)

RTS always ON

See par. 4.1.1 for details.

ACK/NACK PROTOCOL

◆ disable

enable

See par. 4.1.2 for details.

FIFO

disable

◆ enable

See par. 4.1.3 for details.

INTER-CHARACTER DELAY

delay between characters transmitted to Host

Read 2 numbers from the table where:

00 = DELAY disabled
01-99 = DELAY from **1** to **99** milliseconds

◆ delay disabled

RX TIMEOUT

timeout control in reception from Host

Read 2 numbers from the table where:

00 = TIMEOUT disabled
01-99 = TIMEOUT from **.1** to **9.9** seconds

◆ rx timeout 5 seconds

See par. 4.1.4 for details.

SERIAL TRIGGER LOCK

◆ disabled

enabled

Read 2 characters from the Hex/Numeric table in the range 00-FE where:

- First Character enables device trigger
- Second Character inhibits device trigger until the first character is received again.

KEYBOARD NATIONALITY

Not Available for USB-KBD-ALT-MODE Interface

This parameter default value is restored through the Interface Selection code and not Restore Default.

Belgian

English

French

German

Italian

Spanish

Swedish

◆ USA

Japanese

INTER-CHARACTER DELAY

delay between characters transmitted to Host

Read 2 numbers from the table where:

00 =	DELAY disabled
01-99 =	DELAY from **1** to **99** milliseconds

◆ delay disabled

INTER-CODE DELAY

delay between codes transmitted to Host

Read 2 numbers from the table where:

00 =	DELAY disabled
01-99 =	DELAY from **1** to **99** seconds

◆ delay disabled

CONTROL CHARACTER EMULATION

◆ CTRL+ Shift + Key

CTRL + Key

WEDGE PARAMETERS

⊙	***KEYBOARD NATIONALITY***	⊙
⊙	***CAPS LOCK***	⊙
⊙	***CAPS LOCK AUTO-RECOGNITION***	⊙
⊙	***NUM LOCK***	⊙
⊙	***INTER-CHARACTER DELAY***	⊙
⊙	***INTER-CODE DELAY***	⊙
⊙	***CONTROL CHARACTER EMULATION***	⊙
⊙	***KEYBOARD SETTING***	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

.

KEYBOARD NATIONALITY

This parameter default value is restored through the Interface Selection code and not Restore Default.

Belgian

English

French

German

Italian

Spanish

Swedish

◆ USA

The Japanese Keyboard Nationality selection is valid only for IBM AT compatible PCs.

Japanese

CAPS LOCK

◆ caps lock OFF

caps lock ON

Select the appropriate code to match your keyboard caps lock status.

Note: Caps lock manual configuration is ignored when Caps Lock Auto-Recognition is enabled.
For **PC Notebook** interface selections, the caps lock status is automatically recognized, therefore this command is not necessary.

CAPS LOCK AUTO-RECOGNITION (IBM AT COMPATIBLE ONLY)

disable

◆ enable

NUM LOCK

toggle num lock

◆ num lock unchanged

This selection is used together with the Alt Mode interface selection for AT or Notebook PCs.

It changes the way the Alt Mode procedure is executed, therefore it should be set as follows:

- if your keyboard Num Lock is normally on use **num lock unchanged**
- if your keyboard Num Lock is normally off use **toggle num lock**

In this way the device will execute the Alt Mode procedure correctly for your application.

INTER-CHARACTER DELAY

delay between characters transmitted to Host

Read 2 numbers from the table where:

00 = DELAY disabled
01-99 = DELAY from **1** to **99** milliseconds

◆ delay disabled

INTER-CODE DELAY

delay between codes transmitted to Host

Read 2 numbers from the table where:

00 = DELAY disabled
01-99 = DELAY from **1** to **99** seconds

◆ delay disabled

CONTROL CHARACTER EMULATION

◆ CTRL+ Shift + Key

CTRL + Key

KEYBOARD SETTING

ALPHANUMERIC KEYBOARD SETTING

The reader can be used with terminals or PCs with various keyboard types and nationalities through a simple keyboard setting procedure.

The type of computer or terminal must be selected before activating the keyboard setting command.

Keyboard setting consists of communicating to the reader how to send data corresponding to the keyboard used in the application. The keys must be set in a specific order.

Press and release a key to set it.

Some characters may require more than one key pressed simultaneously during normal use (refer to the manual of your PC or terminal for keyboard use). The exact sequence must be indicated to the reader in this case pressing and releasing the different keys.

Example:

If one has to press the "Shift" and "4" keys simultaneously on the keyboard to transmit the character "$" to the video, to set the "$", press and release "Shift" then press and release "4".

Each pressed and released key must generate an acoustic signal on the reader, otherwise repress the key. Never press more than one key at the same time, even if this corresponds to the normal use of your keyboard.

Press "Backspace" to correct a wrong key entry. In this case the reader emits 2 beeps.

Note: "CAPS LOCK" and "NUM LOCK" must be off before starting the keyboard setting procedure. "SHIFT" must be repressed for each character and cannot be substituted by "CAPS LOCK".

setting the alphanumeric keyboard

Read the code above.

Press the keys shown in the following table according to their numerical order:

Some ASCII characters may be missing as this depends on the type of keyboard: these are generally particular characters relative to the various national symbologies. In this case:

- **The first 4 characters (Shift, Alt, Ctrl, and Backspace) can only be substituted with keys not used, or substituted with each other.**
- characters can be substituted with other single symbols (e.g. "SPACE") even if not included in the barcode set used.
- characters can be substituted with others corresponding to your keyboard.

The reader signals the end of the procedure with 2 beeps indicating the keys have been registered.

01 : **Shift**		
02 : **Alt**		
03 : **Ctrl**		
04 : **Backspace**		
05 : **SPACE**	28 : **7**	51 : **N**
06 : **!**	29 : **8**	52 : **O**
07 : **"**	30 : **9**	53 : **P**
08 : **#**	31 : **:**	54 : **Q**
09 : **$**	32 : **;**	55 : **R**
10 : **%**	33 : **<**	56 : **S**
11 : **&**	34 : **=**	57 : **T**
12 : **'**	35 : **>**	58 : **U**
13 : **(**	36 : **?**	59 : **V**
14 : **)**	37 : **@**	60 : **W**
15 : *****	38 : **A**	61 : **X**
16 : **+**	39 : **B**	62 : **Y**
17 : **,**	40 : **C**	63 : **Z**
18 : **-**	41 : **D**	64 : **[**
19 : **.**	42 : **E**	65 : \
20 : **/**	43 : **F**	66 : **]**
21 : **0**	44 : **G**	67 : **^**
22 : **1**	45 : **H**	68 : **_** (underscore)
23 : **2**	46 : **I**	69 : **`**
24 : **3**	47 : **J**	70 : **{**
25 : **4**	48 : **K**	71 : **|**
26 : **5**	49 : **L**	72 : **}**
27 : **6**	50 : **M**	73 : **~**
		74 : **DEL**

PEN EMULATION

⊙ ***OPERATING MODE*** ⊙
⊙ ***MINIMUM OUTPUT PULSE*** ⊙
⊙ ***CONVERSION TO CODE 39*** ⊙
⊙ ***OVERFLOW*** ⊙
⊙ ***OUTPUT LEVEL*** ⊙
⊙ ***IDLE LEVEL*** ⊙
⊙ ***INTER-BLOCK DELAY*** ⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

PEN EMULATION

The operating mode parameters are complete commands and do not require reading the Enter and Exit configuration codes.

OPERATING MODE

◆ interpret mode

Interprets commands without sending them to the decoder.

transparent mode

Sends commands to the decoder without interpreting them.

PEN EMULATION

MINIMUM OUTPUT PULSE

high resolution code emulation

200 µs

400 µs

◆ 600 µs

800 µs

1 ms

1.2 ms

low resolution code emulation

See par. 4.2.1 for details.

CONVERSION TO CODE 39

► disable conversion to Code 39

Transmits codes in their original format.

enable conversion to Code 39

Converts codes read into Code 39 format.

See par. 4.2.2 for details.

OVERFLOW

narrow

◆ medium

wide

See par. 4.2.3 for details.

OUTPUT LEVEL

◆ normal
(white = logic level 0)

inverted
(white = logic level 1)

See par. 4.2.4 for details.

IDLE LEVEL

◆ normal
(black level)

inverted
(white level)

See par. 4.2.4 for details.

INTER-BLOCK DELAY

delay between character blocks transmitted to Host

Read 2 numbers from the table where:

00 =	DELAY disabled
01-99 =	DELAY from .**1** to **9.9** seconds

◆ delay disabled

See par. 4.2.5 for details.

DATA FORMAT

NOT FOR PEN INTERFACES

⊙	***CODE IDENTIFIER***	⊙
⊙	***CUSTOM CODE IDENTIFIER***	⊙
⊙	***HEADER***	⊙
⊙	***TERMINATOR***	⊙
⊙	***FIELD ADJUSTMENT***	⊙
⊙	***FIELD ADJ. CHARACTER***	⊙
⊙	***CODE LENGTH TX***	⊙
⊙	***CHARACTER REPLACEMENT***	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

CODE IDENTIFIER TABLE

CODE	AIM STANDARD	DATALOGIC STANDARD	Custom
2/5 interleaved	] I *y*	N	
2/5 industrial	] X y	P	
2/5 normal 5 bars	] S y	O	
2/5 matrix 3 bars	] X y	Q	
EAN 8	] E 4	A	
EAN 13	] E 0	B	
UPC A	] X y	C	
UPC E	] X y	D	
EAN 8 with 2 ADD ON	] E 5	J	
EAN 8 with 5 ADD ON	] E 6	K	
EAN 13 with 2 ADD ON	] E 1	L	
EAN 13 with 5 ADD ON	] E 2	M	
UPC A with 2 ADD ON	] X y	F	
UPC A with 5 ADD ON	] X y	G	
UPC E with 2 ADD ON	] X y	H	
UPC E with 5 ADD ON	] X y	I	
Code 39	] A y	V	
Code 39 Full ASCII	] A y	W	
CODABAR	] F y	R	
ABC CODABAR	] X y	S	
Code 128	] C y	T	
EAN 128	] C y	k	
ISBT 128	] C4	f	
Code 93	] G y	U	
CIP/39	] X y	Y	
CIP/HR	] X y	e	
Code 32	] X y	X	
MSI	] M y	Z	
Plessey Standard	] P 0	a	
Plessey Anker	] P 1	o	
Telepen	] X 0	d	
Delta IBM	] X 0	c	
Code 11	] H y	b	
Code 16K	] K 0	p	
Code 49	] T y	q	
RSS Expanded Linear and Stacked	] e 0	t	
RSS Limited	] e 0	v	
RSS 14 Linear and Stacked	] e 0	u	

- AIM standard identifiers are not defined for all codes: the X identifier is assigned to the code for which the standard is not defined. The *y* value depends on the selected options (check digit tested or not, check digit tx or not, etc.).

- When customizing the Datalogic Standard code identifiers, 1 or 2 identifier characters can be defined for each code type. If only 1 identifier character is required, the second character must be selected as **FF** (disabled).

- The code identifier can be singly disabled for any code by simply selecting **FF** as the first identifier character.

- Write in the Custom character identifiers in the table above for your records.

CODE IDENTIFIER

◆ disable

Datalogic standard

AIM standard

custom

CUSTOM CODE IDENTIFIER

define custom code identifier(s)

① Read the above code.
(Code Identifiers default to Datalogic standard, see table on previous page).

② Select the code type from the code table in Appendix B for the identifier you want to change.

③ You can define 1 or 2 identifier characters for each code type. If only 1 identifier character is required, the second character must be selected as **FF** (disabled). Read the hexadecimal value corresponding to the character(s) you want to define as identifiers for the code selected in step ②: valid characters are in the range **00-FE**.

Example: To define Code 39 Code Identifier = **@**

Read define custom code identifier(s) + Code 39 + **40** + **FF**

DATA FORMAT

HEADER

no header

one character header

two character header

three character header

four character header

five character header

six character header

seven character header

eight character header

After selecting **one** of the desired Header codes, read the character(s) from the HEX table.

Example:

four character header

+ 41 + 42 + 43 + 44 = Header **ABCD**

For more details see par. 4.3.1.

DATA FORMAT

TERMINATOR

no terminator

one character terminator

two character terminator

three character terminator

four character terminator

five character terminator

six character terminator

seven character terminator

eight character terminator

After selecting **one** of the desired Terminator codes, read the character(s) from the HEX table.

Example:

two character terminator

+ 0D + 0A = Terminator **CR LF**

For more details see par. 4.3.1.

FIELD ADJUSTMENT

◆ disable field adjustment

Field adjustment allows a number of characters *n*, to be added to or subtracted from the barcode read. The adjustment can be different for each enabled code type. To define the field adjustment:

① Read the enable field adjustment code:

enable field adjustment

② Select the code type from the Code Identifier Table in Appendix B.

③ Select the type of adjustment to perform:

right addition

left addition

right deletion

left deletion

④ Read a number in the range **01 - 32** from the Hex/Numeric Table to define how many characters to add or delete:

Conditions:

- Adjustment is only performed on the barcode data, the Code Identifier and Code Length Transmission fields are not modified by the field adjustment parameter.
- If the field setting would subtract more characters than exist in the barcode, the subtraction will take place only to code length 0.
- You can set up to a maximum of 10 different field adjustments on the same barcode family or on different barcode families.

Example: To add 4 characters to the right of Standard Code 39 Codes:

Read enable field adjustment + Code 39 + right addition + **04**

FIELD ADJUSTMENT CHARACTER

① Read the field adjustment character code:

field adjustment character

② Read the hexadecimal value corresponding to the character you want to use for field adjustment. Valid characters are in the range **00-FE**.

Example:

To define the field adjustment character = **A**:

Read field adjustment character + **41**

CODE LENGTH TX

code length transmitted

◆ code length not transmitted

code length transmitted in 4-digit format

The code length is transmitted in the message after the Headers and Code Identifier characters. The code length is calculated after performing any field adjustment operations.

CHARACTER REPLACEMENT

◆ disable character replacement

This parameter allows up to three characters to be replaced from the barcode read. These substitutions are stored in memory. To define each character replacement:

① Read one of the following character replacement codes:

first character replacement

second character replacement

third character replacement

② From the Code Identifier Table in Appendix B, read the Code Identifier for the desired code family.
0 = character replacement will be effective for all code families.

③ From the Hex/Numeric Table read two characters corresponding to the Hex value (**00**-**FE**) which identifies the character to be replaced.

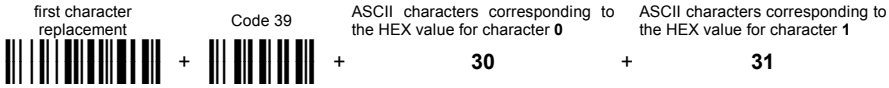
④ From the Hex/Numeric Table read two characters corresponding to the Hex value (**00**-**FE**) which identifies the new character to replace.
FF = the character to be replaced will be substituted with no character, that is, it will be removed from the code.

Example:

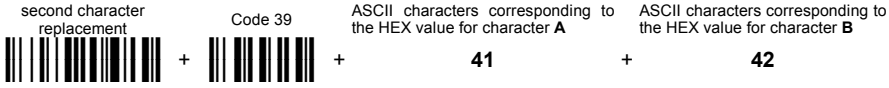
The following strings define:

1. *First Character Replacement:* substitution in *Code 39 barcodes* of all occurrences of the **0** character with the **1** character.

2. *Second Character Replacement:* substitution in *Code 39 barcodes* of all occurrences of the **A** character with the **B** character.



For Code 39 codes containing the string "**0**123", the contents transmitted will be "**1**123".



For Code 39 codes containing the string "**A**BCD", the contents transmitted will be "**B**BCD".

POWER SAVE

⊙	***SCAN RATE***	⊙
⊙	***SLEEP STATE/USB SUSPEND***	⊙
⊙	***ENTER SLEEP TIMEOUT***	⊙
⊙	***STANDBY***	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

POWER SAVE

SCAN RATE

CCD Readers ONLY

quarter

half

◆ maximum

A lower scan rate reduces power consumption but can lengthen reading response time.

SLEEP STATE/USB SUSPEND

ONLY Devices with Button/Trigger

◆ disable

enable

See par. 4.4.1 for details.

POWER SAVE

ENTER SLEEP TIMEOUT

ONLY Devices with Button/Trigger

enter sleep timeout

Read 2 numbers in the range 00-99:

00 = Enter Sleep state immediately

01-99 = corresponds to a max. 9.9 sec. delay before entering the Sleep state.

See par. 4.4.2 for details.

STANDBY

ONLY for CCD Devices

◆ disable

optimize for reading speed

enable

optimize for low power consumption

See par. 4.4.3 for details.

READING PARAMETERS

⊙	***HAND-HELD OPERATION***	⊙
⊙	***STAND OPERATION***	⊙
⊙	***TRIGGER SIGNAL***	⊙
⊙	***TRIGGER-OFF TIMEOUT***	⊙
⊙	***FLASH MODE***	⊙
⊙	***READS PER CYCLE***	⊙
⊙	***SAFETY TIME***	⊙
⊙	***BEEPER INTENSITY***	⊙
⊙	***BEEPER TONE***	⊙
⊙	***BEEPER TYPE***	⊙
⊙	***BEEPER LENGTH***	⊙
⊙	***GOOD READ SPOT DURATION***	⊙
⊙	***STAND RECOGNITION BEEP***	⊙
⊙	***AUTOMATIC OPERATION AIMING LIGHT***	⊙
⊙	***AIMING SYSTEM***	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

READING PARAMETERS

HAND-HELD OPERATION

◆ hardware trigger

☐ software trigger

always on

♣ automatic

* hardware trigger ready

◆ = default value for devices with trigger
☐ = default value for devices without trigger
* = only for CCD readers with trigger
♣ = only for CCD readers

For *Automatic* Hand-Held or Stand Operation, the Safety Time parameter is forced to no code consecutive reading (00).

STAND OPERATION

ONLY Devices with Stand Recognition Beep

hardware trigger

software trigger

always on

◆ ♣ automatic

HARDWARE TRIGGER SIGNAL

ONLY Devices with Button/Trigger

◆ trigger active level

trigger active pulse

See par. 4.5.1 for details

TRIGGER-OFF TIMEOUT

ONLY Devices with Button/Trigger

trigger-off timeout

Read 2 numbers in the range 00-99:

00 = disables the trigger-off timeout
01-99 = corresponds to a max. 99-sec. delay after the trigger press to allow the reader to turn off automatically.

◆ trigger-off timeout disabled

See par. 4.5.3 for details.

FLASH MODE

"FLASH" ON duration

"FLASH" OFF duration

Read 2 numbers in the range 01-99:
01 to 99 = from .1 to 9.9 seconds.

◆ Flash-ON = 1 sec. Flash-OFF = 0.6 sec

READS PER CYCLE

◆ one read per cycle

multiple reads per cycle

See par. 4.5.4 for details.

SAFETY TIME

safety time

Limits same code consecutive reading.

Read 2 numbers in the range 00-99:

00 = no same code consecutive reading until reader is removed (no decoding) for at least 400 ms.

01 to 99 = timeout from .1 to 9.9 seconds before a consecutive read on same code.

◆ safety time = 0.5 sec

See par. 4.5.5 for details.

BEEPER INTENSITY

beeper off *

low intensity

medium intensity

◆ high intensity

* This sets the beeper OFF for data entry, while for all other beeper signals it has the meaning “very low intensity”. The Beeper Intensity parameter is effective for all operating conditions described in par. 1.1.

READING PARAMETERS

BEEPER TONE

tone 1

◆ tone 2

tone 3

tone 4

BEEPER TYPE

◆ monotone

bitonal

BEEPER LENGTH

long

◆ short

GOOD READ SPOT DURATION

CCD Long Range Readers ONLY

disable

short

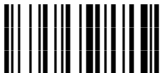
◆ medium

long

STAND RECOGNITION BEEP

ONLY Readers with Stand Recognition

disable



◆ enable

AUTOMATIC OPERATION AIMING LIGHT

CCD Long Range Readers ONLY

disable

◆ enable

See par. 4.5.6 for details.

AIMING SYSTEM

Laser Readers ONLY

◆ disable

300 ms

500 ms

1 sec

See par. 4.5.7 for details.

DECODING PARAMETERS

⊙	***INK SPREAD***	⊙
⊙	***OVERFLOW CONTROL***	⊙
⊙	***INTERDIGIT CONTROL***	⊙
⊙	***DECODING SAFETY***	⊙
⊙	***PUZZLE SOLVER™***	⊙

CAUTION

Before changing these parameter values read the descriptions in par. 4.6.

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

INK SPREAD

disable

◆ enable

See par. 4.6.1 for details.

OVERFLOW CONTROL

disable

◆ enable

See par. 4.6.2 for details.

INTERDIGIT CONTROL

disable

◆ enable

See par. 4.6.3 for details.

DECODING SAFETY

◆ one read

(decoding safety disabled)

two reads

three reads

four reads

Required number of good reads before accepting code.

PUZZLE SOLVER™

◆ disable

enable

In the case of damaged or poorly printed codes, this parameter allows reading multiple parts of the single code to reconstruct it.

To read codes using this technology, simply move the reader over the code so that each line of the code is scanned.

Conditions:

- This parameter is only valid for the following codes:

EAN 8 without Add-on	**EAN 13 without Add-on**	**UPC A without Add-on**
Code 128	**Code 39**	

- For Code 39, Check digit control without transmission is forced.
- PuzzleSolver™ is disabled when code ISBT 128 is enabled.

CODE SELECTION

⊙	***EAN/UPC FAMILY***	⊙
⊙	***2/5 FAMILY***	⊙
⊙	***CODE 39 FAMILY***	⊙
⊙	***CODE 128 FAMILY***	⊙
⊙	***CODABAR FAMILY***	⊙
⊙	***CODE 93***	⊙
⊙	***MSI***	⊙
⊙	***PLESSEY***	⊙
⊙	***TELEPEN***	⊙
⊙	***DELTA IBM***	⊙
⊙	***CODE 11***	⊙
⊙	***CODE 16K***	⊙
⊙	***CODE 49***	⊙
⊙	***RSS CODES***	⊙

1. Read the **Enter Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of each page.

CODE SELECTION

DISABLES ALL CODE FAMILIES

NOTE

The reader allows up to 5 code selections. This does not limit the number of CODES enabled to 5, as it depends on the code family.

SINGLE SELECTIONS =

- **ONE** combination code from the EAN family
- **ONE** code from the 2/5 family

Example

5 code selections:

1. **2/5 Interleaved**
2. **2/5 Industrial**
3. Code 128 + EAN 128
4. Code 39 Full ASCII + Code 32
5. **UPC A/UPC E**

In this section all SINGLE code selections are underlined and in bold.

EAN/UPC FAMILY

disable the family

① Read the desired family code

Note:
Since the EAN/UPC without ADD ON code selection is enabled by default, to correctly enable another selection, first disable the family.

EAN 8/EAN 13/UPC A/UPC E with and without ADD ON

WITHOUT ADD ON

◆ **EAN 8/EAN 13/UPC A/UPC E**

EAN 8/EAN 13

UPC A/UPC E

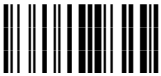
CODE SELECTION

WITH ADD ON 2 AND 5

EAN 8/EAN 13/UPC A/UPC E

EAN 8/EAN 13

UPC A/UPC E



WITH ADD ON 2 ONLY

EAN 8/EAN 13

UPC A/UPC E

WITH ADD ON 5 ONLY

EAN 8/EAN 13

UPC A/UPC E

EAN/UPC CHECK DIGIT TX SELECTIONS

For each code type in this family you can choose to transmit the check digit or not

CHECK DIGIT TRANSMISSION

EAN 8

EAN 13

UPC A

UPC E

NO CHECK DIGIT TRANSMISSION

EAN 8

EAN 13

UPC A

UPC E

CONVERSION OPTIONS

UPC E to UPC A conversion

UPC E to EAN 13 conversion

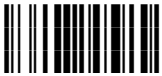
UPC A to EAN 13 conversion

EAN 8 to EAN 13 conversion

Enable only ISBN conversion

Enable only ISSN conversion

Enable both ISBN and ISSN conversion



Disable both ISBN and ISSN conversion

CODE SELECTION

2/5 FAMILY

disables the family

① Read the desired family code

◆ **Interleaved 2/5**

Normal 2/5 (5 Bars)

Industrial 2/5 (IATA)

Matrix 2/5 (3 Bars)

The pharmaceutical code below is part of the 2/5 family but has no check digit or code length selections.

Code CIP/HR

French pharmaceutical code

② Read a check digit selection

CHECK DIGIT TABLE

no check digit control

◆ check digit control and transmission

check digit control without transmission

③ Read **4** numbers for the code length where:

- **First 2 digits** = minimum code length.
- **Second 2 digits** = maximum code length.

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples:
0199 = variable from 1 to 99 digits in the code.
1010 = 10 digit code length only.

CODE SELECTION

CODE 39 FAMILY

disables the family

① Read the desired family code

◆ **Standard Code 39**

Full ASCII Code 39

② Read a check digit selection

CHECK DIGIT TABLE

◆ no check digit control

check digit control
and transmission

check digit control
without transmission

CODE SELECTION

The pharmaceutical codes below are part of the Code 39 family but have no check digit selections.

Code CIP39

French pharmaceutical code

Code 32

Italian pharmaceutical code

CODE LENGTH (optional)

The code length selection is valid for the entire Code 39 family

Read the code + **4** numbers for the code length where:

First 2 digits = minimum code length.
Second 2 digits = maximum code length.

set code length

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

CODE 128 FAMILY

disables the family

① Read the desired family code

◆ **Code 128**

control without transmission
of check digit

EAN 128

control without transmission
of check digit

Add GS Before Code

Code EAN 128 uses the ASCII <GS> character to separate a variable length code field from the next code field. This character can also be added before the code.

◆ disable

enable

If the <GS> character has been modified in the Character Replacement parameter, the new character is affected by this command.

ISBT 128

Enabling ISBT 128 automatically disables Puzzle Solver™.

CODE LENGTH (optional)

The code length selection is valid for the entire Code 128 family.

Read the code + **4** numbers for the code length where:
First 2 digits = minimum code length
Second 2 digits = maximum code length

set code length

The maximum code length is 99 characters. The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010**= 10 digit code length only.

The length is calculated on the output string.

CODE 93

◆ disables the code

Code 93

control without transmission
of check digit

CODE SELECTION

CODABAR FAMILY

◆ disables the family

① Read the desired equality control code

Standard Codabar

no start/stop character equality control

Standard Codabar

start/stop character equality control

② Read a start/stop transmission selection

START/STOP CHARACTER TRANSMISSION

no transmission

transmission

The Codabar ABC code below uses a fixed start/stop character transmission selection.

Codabar ABC

no start/stop character equality control but transmission.

CODE SELECTION

Codabar ABC Forced Concatenation

enable Codabar ABC with forced concatenation

non start/stop character equality control but transmission

CODE LENGTH (optional)

The code length selection is valid for the entire Codabar family

Read the code + **4** numbers for the code length where:
First 2 digits = minimum code length.
Second 2 digits = maximum code length.

set code length

The maximum code length is **99** characters.

The minimum code length must always be less than or equal to the maximum.

Examples: **0199** = variable from 1 to 99 digits in the code. **1010** = 10 digit code length only.

START/STOP CHARACTER CASE IN TRANSMISSION

The start/stop character case selections below are valid for the entire Codabar family:

transmit start/stop characters in lower case

transmit start/stop characters in upper case

MSI

◆ disables the family

Enable the code by selecting one of the check digit selections.

no check digit control

MOD10 check digit control
no check digit transmission

MOD10 check digit control
check digit transmission

MOD11 - MOD10 check digit control
no check digit transmission

MOD11 - MOD10 check digit control
check digit transmission

MOD10 - MOD10 check digit control
no check digit transmission

MOD10 - MOD10 check digit control
check digit transmission

PLESSEY

◆ disables the family

Enable the code by selecting one of the check digit selections.

Standard Plessey

no check digit control

check digit control
check digit transmitted

check digit control
check digit not transmitted

Anker Plessey

no check digit control

check digit control
check digit transmitted

check digit control
check digit not transmitted

TELEPEN

◆ disables the family

Enable the code by selecting one of the check digit selections.

Numeric Telepen

no check digit control

check digit control
check digit transmitted

check digit control
check digit not transmitted

Alphanumeric Telepen

no check digit control

check digit control
check digit transmitted

check digit control
check digit not transmitted

DELTA IBM

◆ disables the family

Enable the code by selecting one of the check digit selections.

no check digit control

Type 1 check digit control

Type 2 check digit control

CODE 11

◆ disables the family

Enable the code by selecting one of the check digit selections.

no check digit control

Type C check digit control
check digit transmitted

Type C check digit control
check digit not transmitted

Type K check digit control
check digit transmitted

Type K check digit control
check digit not transmitted

Type C and Type K
check digit control
check digits transmitted

Type C and Type K
check digit control
check digits not transmitted

CODE 16K

◆ disables the code

Code 16K

To read stacked codes, simply move the reader over the code so that each line of the code is scanned.

CODE 49

◆ disables the code

Code 49

To read stacked codes, simply move the reader over the code so that each line of the code is scanned.

RSS CODES

◆ disables the family

DISABLE CODE	ENABLE CODE
disable RSS Expanded Linear and Stacked	
	enable RSS Expanded Linear and Stacked
disable RSS Limited	
	enable RSS Limited
disable RSS 14 Linear and Stacked	
	enable RSS 14 Linear and Stacked

To read the stacked version of these codes, simply move the reader over the code so that each line of the code is scanned.

ADVANCED FORMATTING

NOT FOR PEN INTERFACES

⊙ ***CONCATENATION*** ⊙

⊙ ***ADVANCED FORMATTING*** ⊙

1. Read the **Enter Configuration** code ONCE, available at the top of page.

2. **Read configuration codes precisely following the numbered procedure given.**

= Read the code and follow the procedure given

◆ = Default value

3. Read the **Exit and Save Configuration** code ONCE, available at the top of page.

CONCATENATION

◆ disable

enable

Permits the concatenation of two codes defined by code type and length. It is possible to set a timeout for the second code reading and to define code transmission if the timeout expires.

The order of transmission is CODE 1-CODE 2.

Define Concatenation

1 **Code 1**

code ID

Read the code type from the Code Identifier Table beginning in Appendix B.

code length

Read a number in the range **01-99** from the Hex/Numeric Table.

2 **Code 2**

code ID

Read the code type from the Code Identifier Table beginning in Appendix B.

code length

Read a number in the range **01**-**99** from the Hex/Numeric Table.

---

3 **Concatenation Result Code ID**

use code 1 ID

use code 2 ID

Since you can concatenate codes from different families, you must select the Code ID character of the resulting code. The Code ID character will be sent in the output message only if it is enabled according to the Code Identifier selection (Datalogic, AIM, or Custom).

---

4 **Concatenation Timeout**

timeout

Read two numbers in the range **00** to **99**
00= no timeout
01-99 = timeout from 1 to 99 seconds

5 Transmission after Timeout

no code transmitted
after timeout

only code 1 transmitted
(if read) after timeout

only code 2 transmitted
(if read) after timeout

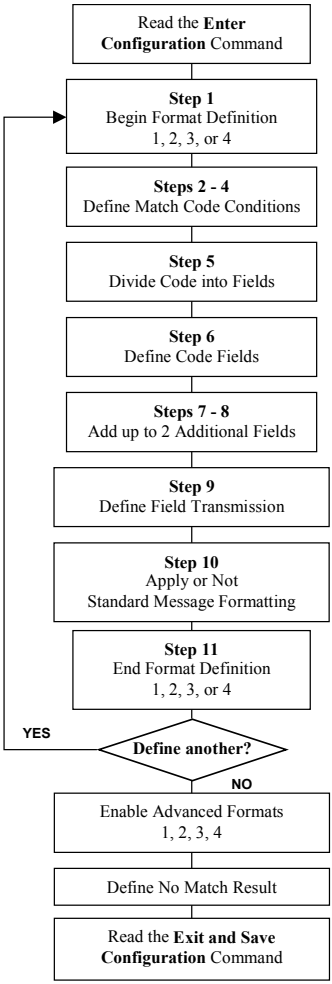
either code 1 or code 2 transmitted
after timeout

Define the timeout, which determines the valid waiting period between the two codes, in order to accept concatenation. If the timeout expires, the resulting action will be based on this selection.

ADVANCED FORMATTING

Advanced formatting has been designed to offer you complete flexibility in changing the format of barcode data **before** transmitting it to the host system. This formatting will be performed when the barcode data meets certain criteria which you will define in the following procedure.

Up to 4 advanced code management formats can be defined and saved in memory. For each format you must complete the entire configuration procedure:


Read the **Enter Configuration** Command
Step 1 Begin Format Definition 1, 2, 3, or 4
Steps 2 - 4 Define Match Code Conditions
Step 5 Divide Code into Fields
Step 6 Define Code Fields
Steps 7 - 8 Add up to 2 Additional Fields
Step 9 Define Field Transmission
Step 10 Apply or Not Standard Message Formatting
Step 11 End Format Definition 1, 2, 3, or 4
YES
Define another?
NO
Enable Advanced Formats 1, 2, 3, 4
Define No Match Result
Read the **Exit and Save Configuration** Command

ADVANCED FORMATTING

1 Begin Format Definition

begin Format 1 definition

begin Format 2 definition

begin Format 3 definition

begin Format 4 definition

2 Match Code Type

match code type

Read the above code + the code type to match from the Code Identifier Table in Appendix B.

OR

any code type

3 Match Code Length

Match code length

Read the above code + two numbers in the range **01** to **99** for the exact code length.

OR

any code length

4 Match with Predefined Characters

no match

OR

match with 1 character

match with a 2-character string

match with a 3-character string

match with a 4-character string

After selecting the predefined match code, read the character(s) from the HEX table. Range of characters = **00-FE**.

Example:
Match code with the 2-character predefined string = "@@".

Match with a 2-character string

Read + 40 + 40

AND position of first character in predefined string

Read the above code + two numbers in the range **01** to **99** representing the character position in the code where the first character of the predefined string must be found.

Read **00** if the match string can be found in any character position.

5 Divide Code into Fields

divide code into fields

Read one number in the range **1** to **5** to divide the code into fields.

6 Define Code Fields

define code fields

Each code field length can be set by either:

a) defining a field separator character to be found in the code itself. In this case you can choose to **discard** the code separator character or **include** it as the last character of the field.

OR BY

b) specifying a specific character length up to the maximum of 99 characters.

OR BY

c) selecting the last field as variable length (if any).

You must define the same number of fields as selected in step 5, including fields that will not be transmitted.

ADVANCED FORMATTING

DEFINE FIELD 1 BY:
EITHER

a) field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator

include separator

OR

b) field length

Read two numbers in the range **01** to **99** to define the field length.

OR

c) this is the last field (variable length)

AND

Field 1 Terminators

no field terminators

1 field terminator

2 field terminators

Read the field terminator character(s) from the HEX table.
Valid range of characters for all readers = **00-FE**.

For readers using Wedge interface, all values from **9C** to **FE** send the Space character.

ADVANCED FORMATTING

DEFINE FIELD 2 BY:
EITHER

a) ☞ field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator

include separator

OR

b) ☞ field length

Read two numbers in the range **01** to **99** to define the field length.

OR

c) this is the last field (variable length)

AND

Field 2 Terminators

no field terminators

☞ 1 field terminator

☞ 2 field terminators

Read the field terminator character(s) from the HEX table.
Valid range of characters for all readers = **00-FE**.

For readers using Wedge interface, all values from **9C** to **FE** send the Space character.

ADVANCED FORMATTING

DEFINE FIELD 3 BY:
EITHER

a) field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator

include separator

OR

b) field length

Read two numbers in the range **01** to **99** to define the field length.

OR

c) this is the last field (variable length)

AND

Field 3 Terminators

no field terminators

1 field terminator

2 field terminators

Read the field terminator character(s) from the HEX table.
Valid range of characters for all readers = **00-FE**.

For readers using Wedge interface, all values from **9C** to **FE** send the Space character.

ADVANCED FORMATTING

DEFINE FIELD 4 BY:
EITHER

field separator

a) ☞

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator

include separator

OR

field length

b) ☞

Read two numbers in the range **01** to **99** to define the field length.

OR

this is the last field (variable length)

c)

AND

Field 4 Terminators

no field terminators

1 field terminator ☞

2 field terminators ☞

Read the field terminator character(s) from the HEX table.
Valid range of characters for all readers = **00-FE**.

For readers using Wedge interface, all values from **9C** to **FE** send the Space character.

ADVANCED FORMATTING

DEFINE FIELD 5 BY:
EITHER

a) ☞ field separator

Read the field separator character from the HEX table. Range of characters = **00-FE**.

discard separator

include separator

OR

b) ☞ field length

Read two numbers in the range **01** to **99** to define the field length.

OR

c) this is the last field (variable length)

AND

Field 5 Terminators

no field terminators

☞ 1 field terminator

☞ 2 field terminators

Read the field terminator character(s) from the HEX table.
Valid range of characters for all readers = **00-FE**.

For readers using Wedge interface, all values from **9C** to **FE** send the Space character.

7 First Additional Fixed Field

no fixed field

1 character fixed field

2 character fixed field

3 character fixed field

4 character fixed field

5 character fixed field

6 character fixed field

After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = **00-FE**.

Example:

4 Character Fixed Field

+ 4D + 41 + 49 + 4E = MAIN

8 Second Additional Fixed Field

no fixed field

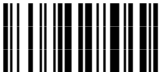
1 character fixed field

2 character fixed field

3 character fixed field

4 character fixed field

5 character fixed field



6 character fixed field

After selecting **one** of the Additional Fixed Field codes, read the corresponding character(s) from the HEX table. Range of characters = **00-FE**.

Example:

3 Character Fixed Field

+ 53 + 45 + 54 = SET

9 Field Transmission

number of fields to transmit

Read one number in the range **1** to **7** for the number of fields to transmit. **Include only fields to be transmitted.**

Field Order Transmission

Read the codes corresponding to the fields to transmit in the order in which they are to be transmitted, see example.

field 1

field 2

field 3

field 4

field 5

additional field 1

additional field 2

Example:

The barcode is divided into 2 defined fields plus 1 additional fixed field.

Transmit in the order: Field 2, Additional Field 1, Field 1.

Number of Fields to Transmit **+ 3 +** Field 2 + Additional Field 1 + Field 1

ADVANCED FORMATTING

10 Standard Formatting

do not apply standard formatting

apply standard formatting

After performing Advanced Formatting on the barcode read, Standard Formatting (Headers, Code Length, Code ID, and Terminators) can be applied to the message to be transmitted.

11 End Format Definition

end Format 1 definition

end Format 2 definition

end Format 3 definition

end Format 4 definition

ADVANCED FORMATTING

Enable Advanced Format

◆ no Advanced Formats enabled

Advanced Format 1

enable

disable

Advanced Format 2

enable

disable

Advanced Format 3

enable

disable

Advanced Format 4

enable

disable

No Match Result

clear data - no transmission

transmit data using standard format

This selection determines the action to be taken when codes read do not conform to the advanced format requisites (no match).

- Codes not matching can be ignored, cleared from memory and not transmitted.
- Codes not matching can be transmitted using the Standard formatting (Headers, Code Length, Code ID, and Terminators).

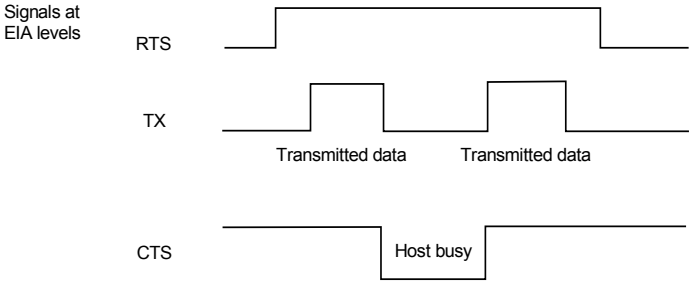
4 REFERENCES

4.1 RS232 PARAMETERS

4.1.1 Handshaking

Hardware handshaking: (RTS/CTS)

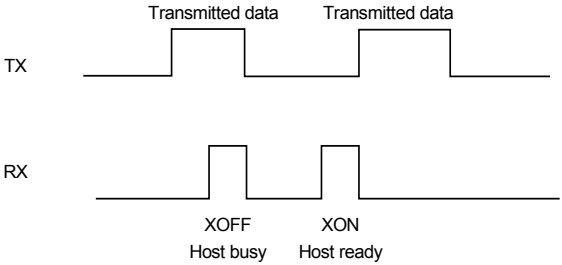
The RTS line is activated by the decoder before transmitting a character. Transmission is possible only if the CTS line (controlled by the Host) is active.



RTS/CTS handshaking

Software handshaking: (XON/XOFF)

During transmission, if the Host sends the XOFF character (13 Hex), the decoder interrupts the transmission with a maximum delay of one character and only resumes when the XON character (11 Hex) is received.



XON/XOFF handshaking

4.1.2 ACK/NACK Protocol

This parameter sets a transmission protocol in which the Host responds to the reader after every code transmitted. The Host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception.

If the reader does not receive an ACK or NACK, transmission is ended after the RX Timeout (see par. 4.1.4).

Selection of the ACK/NACK protocol automatically disables FIFO buffering see par. 4.1.3.

4.1.3 FIFO

This parameter determines whether data (barcodes) are buffered on a First In First Out basis allowing faster data collection in certain cases for example when using slow baud rates and/or hardware handshaking.

If the FIFO buffering is enabled, codes are collected and sent out on the serial line in the order of acquisition. Several hundred characters can be collected (buffer full), after which the reader signals an error and discards any further codes until the transmission is restored.

If the FIFO buffering is disabled, each code must be transmitted before another one can be read.

4.1.4 RX Timeout

When the RS232 interface is selected, the Host can be used to configure the device by sending it command strings (see appendix A).

This parameter can be used to automatically end data reception from the Host after the specified period of time.

If no character is received from the Host, after the timeout expires, any incomplete string (any string not terminated by <CR>) is flushed from the device buffer.

4.2 PEN PARAMETERS

4.2.1 Minimum Output Pulse

This parameter sets the duration of the output pulse corresponding to the narrowest element in the barcode. In this way the code resolution is controlled by the signal sent to the decoder, independently of the physical resolution of the code read.

The shortest pulse (200 μs) corresponds to high-resolution code emulation and therefore a shorter transfer speed to the decoder (for decoders able to work on high-resolution codes). Likewise, longer pulses correspond to low-resolution code emulation and therefore a longer transfer time to the decoder.

4.2.2 Conversion to Code 39

When using these readers it is possible to convert all codes to Code 39. By disabling this option the decoded codes will be transmitted in their original format; except for the following codes which are ALWAYS converted into Code 39 format:
MSI, Plessey, Telepen, Delta IBM, Code 11, Code 16K, Code 49 and RSS Codes.

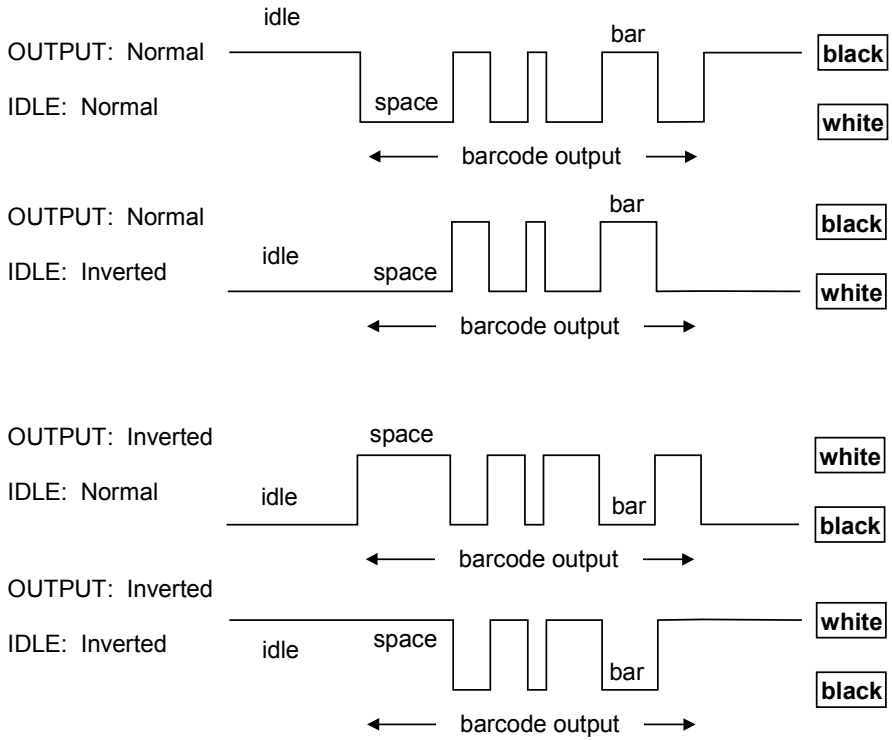
4.2.3 Overflow

This parameter generates a white space before the first bar and after the last bar of the code. The selections are as follows:

narrow = space 10 times the minimum output pulse.
medium = space 20 times the minimum output pulse.
wide = space 30 times the minimum output pulse.

4.2.4 Output and Idle Levels

The following state diagrams describe the different output and idle level combinations for Pen emulation:



Output and Idle Levels

4.2.5 Inter-Block Delay

For the PEN Emulation interface, data are sent to the Host in fixed size blocks of 20 characters each. The inter-block delay parameter allows setting a delay between each block sent to the Host.

4.3 DATA FORMAT

4.3.1 Header/Terminator Selection

The header/terminator selection is not effected by the reading of the restore default code. In fact, header and terminator default values depend on the interface selection:

RS232 and USB-COM:	no header, terminator CR-LF
WEDGE and USB-KBD:	no header, terminator ENTER
WEDGE ALT-MODE and USB-KBD-ALT-MODE:	no header, terminator CR

These default values are always restored through the reading of the relative interface selection code, see chapter 2.

For the WEDGE interface, the following extended keyboard values can also be configured:

EXTENDED KEYBOARD TO HEX CONVERSION TABLE				
	IBM AT IBM 3153 APPLE ADB	**IBM XT**	**IBM 31xx, 32xx, 34xx, 37xx**	**Wyse Digital**
HEX	KEY	KEY	KEY	KEY
83	ENTER	ENTER	FIELD EXIT	RETURN
84	TAB	TAB	TAB	TAB
85	F1	F1	F1	F1
86	F2	F2	F2	F2
87	F3	F3	F3	F3
88	F4	F4	F4	F4
89	F5	F5	F5	F5
8A	F6	F6	F6	F6
8B	F7	F7	F7	F7
8C	F8	F8	F8	F8
8D	F9	F9	F9	F9
8E	F10	F10	F10	F10
8F	F11	ESC	F11	F11
90	F12	BACKSPACE	F12	F12
91	HOME	HOME	ENTER	F13
92	END	END	RESET	F14
93	PG UP	PG UP	INSERT	F15
94	PG DOWN	PG DOWN	DELETE	F16
95	↑	↑	FIELD -	UP
96	↓	↓	FIELD +	DOWN
97	←	←	ENTER (Paddle)	LEFT
98	→	→	PRINT	RIGHT
99	ESC	ESC		ESC
9A	CTRL (Right)	CTRL (Right)		CTRL (Right)
9B	Euro	Space	Space	Space

For all readers using Wedge interface, all values from **9C** to **FE** send the Space character.

4.3.2 Set Custom Extended Header/Terminator Keys

The extended Header/Terminator keys for **Wedge Interface users** can be customized by defining them through a simple keyboard setting procedure.

For example, the Numeric Keypad keys can be set for use as Headers or Terminators by substituting the default extended keys using this procedure.

The type of computer or terminal must be selected before activating the keyboard setting command.

Press and release a key to set it.

Some characters may require more than one key pressed simultaneously during normal use (refer to the manual of your PC or terminal for keyboard use). The exact sequence must be indicated to the reader in this case pressing and releasing the different keys.

Example:

If one has to press the "Shift" and "4" keys simultaneously on the keyboard to transmit the character "$" to the video, to set the "$", press and release "Shift" then press and release "4".

Each pressed and released key must generate an acoustic signal on the reader, otherwise repress the key. Never press more than one key at the same time, even if this corresponds to the normal use of your keyboard.

Press "Backspace" to correct a wrong key entry. In this case the reader emits 2 beeps.

Note: "CAPS LOCK" and "NUM LOCK" must be off before starting the keyboard setting procedure. "SHIFT" must be repressed for each character and cannot be substituted by "CAPS LOCK".

Enter Configuration

Exit and Save Configuration

Set Custom Extended Header/Terminator Keys

Read the code above.

- **If the first 4 KEYS (Shift, Alt, Ctrl, and Backspace) are not available on your keyboard, you can only substitute them with keys not used, or substitute them with each other.**
- Keys 5 to 28 must be defined

Press the desired keys in the following order:

The reader signals the end of the procedure with 2 beeps indicating the keys have been registered.

CUSTOM EXTENDED KEYBOARD SETTING TABLE		
		Custom
Order	HEX	KEY
01	**-**	Shift
02	**-**	Alt
03	**-**	Ctrl
04	**-**	Backspace
05	**83**	
06	**84**	
07	**85**	
08	**86**	
09	**87**	
10	**88**	
11	**89**	
12	**8A**	
13	**8B**	
14	**8C**	
15	**8D**	
16	**8E**	
17	**8F**	
18	**90**	
19	**91**	
20	**92**	
21	**93**	
22	**94**	
23	**95**	
24	**96**	
25	**97**	
26	**98**	
27	**99**	
28	**9A**	

4.4 POWER SAVE

4.4.1 Sleep State/USB Suspend

When using standard devices, this mode allows the μP in the reader to enter a "Sleep" state for minimum power consumption. This command is only valid when hardware trigger type is selected.

Before entering Sleep mode, the following are verified:

- no commands coming from Host
- no data being transmitted to Host
- Enter Sleep Timeout ended (see par. 4.4.2)

It is possible to exit Sleep mode either by pressing the button/trigger or by inserting the reader into the Stand (only for devices with Stand Recognition Beep).

Enabling the Sleep State/USB Suspend implements Standby mode for CCD devices, see par. 4.4.3.

When using USB devices, this mode allows the device to manage Selective Suspend conditions generated by the Host Operating System in which optimizing low power consumption (ex. Windows Stand-by). It is possible to exit the Suspend mode either from the Host (ex. moving the mouse during Stand-by) or through the barcode reader. The latter, called Remote Wakeup, makes the device wake up the Host restoring the communication. Remote Wakeup is possible either by pressing the button/trigger or by putting the reader into the stand (only for devices with Stand Recognition Beep).

4.4.2 Enter Sleep Timeout

For readers that have the Sleep state enabled, this timeout determines when the reader will enter this state.

4.4.3 Standby *(only for CCD devices)*

If this command is enabled, part of the CCD circuitry shuts down (Standby), in order to optimize low power consumption when not reading. When the trigger is pressed this circuitry powers up. This mode causes a minor delay before the reader is ready.

4.5 READING PARAMETERS

4.5.1 Hand-Held and Stand Operation

These parameter groups allow setting different reading modes for Hand-Held Operation and Stand Operation:

- SoftwareTrigger: the reader is set in FLASH MODE. Code reading takes place during the *flash on* time;
- Hardware Trigger: the code reading is started with a trigger press (ON);
- Hardware Trigger Ready: the illuminator is switched ON when the reader sees a code. It functions as a pointer aiming at the code to be read. The reading phase starts only when the trigger is pressed. In this mode the reader is automatically set to **trigger active level** and **one read per cycle** parameters. (Only for Hand-Held Operation).
- Automatic: the illuminator is switched ON when the reader sees a code. The reading phase starts automatically.
- Always ON: the illuminator/laser is always ON and the reader always ready for code reading.

4.5.2 Hardware Trigger Signal

This parameter determines how the reader ON state is controlled for readers with button/trigger when *Hardware Trigger* is selected:

- trigger level: the reader goes ON when the trigger is pressed and goes OFF when it is released
- trigger pulse: the reader goes ON at the first trigger press and goes OFF only at a second press

4.5.3 Trigger-Off Timeout

When this timeout is selected, the reader turns OFF automatically after the desired period of time.

4.5.4 Reads per Cycle

In general, a **reading cycle** corresponds to the ON + OFF times of a device. The resulting effects of this parameter on code reading depend on other related configuration conditions. Here are the definitions of ON and OFF times.

- For readers using the software trigger parameter (FLASH MODE), a reading cycle corresponds to the flash on + flash off times. Code reading takes place during the flash on time.
- For readers using the hardware trigger parameter, a reading cycle corresponds to a trigger press (ON) + one of the following OFF events:

  trigger release (for *trigger active level*)

  a second trigger press (for *trigger active pulse*)

  trigger-off timeout (see par. 4.5.3).

When **one read per cycle** is selected, the device decodes only one code during the ON period and immediately turns the reader OFF. It is only possible to read another code when the next ON time occurs.

In **multiple reads per cycle**, the ON period is extended so that the device can continue decoding codes until an OFF event occurs. For software trigger mode, the *flash on* period is immediately reset after each read and therefore extended. If another code is decoded before the reset *flash on* period expires, it is again reset and the effect is that the device remains ON, decoding codes until the *flash on* or *timeout* period expires.

The Safety Time parameter should be used in this case to avoid unwanted multiple reading of the same code, see par. 4.5.5.

4.5.5 Safety Time

Safety time prevents the device from immediately decoding the same code more than once. Same code consecutive reading can be disabled requiring the reader to be removed from the code (no decoding) for at least 400 ms, or a timeout can be set up to 9.9 seconds before the decoder will accept the same code. Reading is immediate if the code changes.

For *Automatic* Hand-Held or Stand Operation, the Safety Time parameter is forced to no code consecutive reading (00).

The safety time parameter is not applicable when reading stacked codes or when setting one read per cycle in hardware trigger operating mode, since these settings require voluntary action by the user.

4.5.6 Automatic Operation Aiming Light

This parameter is valid for CCD long range devices in *Automatic* Hand-Held or Stand Operation and allows an aiming light to be continuously emitted in front of the reader to facilitate the positioning of the barcode to be read.

4.5.7 Aiming System

This parameter is valid for laser readers and provides a programmable timeout for the aiming system. If enabled, the scan line emitted from the reading window is preceded by a red spot which must illuminate the code center to get the best reading performance (see figure, ①). Once the defined timeout is reached, the red spot disappears and is followed by the scan line to start the code scanning.

1

2

4.6 DECODING PARAMETERS

CAUTION

These parameters are intended to enhance the decoding capability of the reader for particular applications. Used incorrectly, they can degrade the reading performance or increase the possibility of a decoding error.

4.6.1 Ink-Spread

The ink-spread parameter allows the decoding of codes which are not perfectly printed because the page texture tends to absorb the ink.

4.6.2 Overflow Control

The overflow control parameter can be disabled when decoding codes printed on small surfaces, which don't allow the use of an overflow space.

This command does not effect code families 2/5, Code 128 and Code 93.

4.6.3 Interdigit Control

The interdigit control parameter verifies the interdigit spacing for code families Code 39 and Codabar.

4.7 CONFIGURATION EDITING COMMANDS

The following commands carry out their specific function and then exit the configuration environment.

Command	Description
$+$*	Restore system default configuration (see the relative Quick Reference Manual for default settings)
$+$!	Transmit the Software release. This command is not effective with the Pen emulation interface.
$+$&	Transmit the device configuration in ASCII format. This command is not effective with the Pen emulation interface.

4.8 CONFIGURATION COPY COMMAND

Procedure:

① Connect the **master** (correctly configured reader) and the **slave** (reader to be configured) together through two RS232 serial interface cables and external power supply. Accessory cables and power supply are available from your Datalogic distributor to provide this connection.

RS232 Cables: CAB363 & CAB364 or CAB320 & CAB328

Power Supply: PG5

② Using the slave device, read the Restore Default barcode and then the RS232 interface barcode from par. 2.2 of this manual or from the Quick Reference Manual.

③ With the master device, read the Configuration Copy barcode below.

Copy Configuration

$+ZZ0$-

The configuration will be copied from the master to the slave device. The slave device signals the end of the procedure with a series of beeps.

Note: The master device can be configured for any interface.

4.9 DEFAULT PARAMETERS FOR POS SYSTEMS

The default values for the RS232 and Data Format parameters for POS systems are listed in the following table:

	NIXDORF Mode A	FUJITSU	ICL Mode
RS232 Group			
Baud Rate	9600	9600	9600
Parity	Odd	None	Even
Data Bits	8	8	8
Stop Bits	1	1	1
Handshaking	Hardware (RTS/CTS)	None	RTS always on
ACK/NACK Protocol	Disabled	Disabled	Disabled
FIFO	Enabled	Enabled	Enabled
Inter-Character Delay	Disabled	Disabled	Disabled
RX Timeout	9.9 sec	2 sec	9.9 sec
Serial Trigger Lock	Disabled	Disabled	Disabled
Data Format Group			
Code Identifier	Custom	Custom	Custom
Header	No Header	No Header	No Header
Terminator	CR	CR	CR
Field Adjustment	Disabled	Disabled	Disabled
Code Length TX	Not Transmitted	Not Transmitted	Not Transmitted
Character Replacement	Disabled	Disabled	Disabled

The table below lists all the Code Identifiers available for POS systems:

CODE	NIXDORF Mode A	FUJITSU	ICL Mode
UPC-A	A0	A	A
UPC-E	C0	E	E
EAN-8	B	FF	FF
EAN-13	A	F	F
Code 39	M	None	C [code length]
Codabar	N	None	N [code length]
Code 128	K	None	L [code length]
Interleaved 2 of 5	I	None	I [code length]
Code 93	L	None	None
Industrial 2 of 5	H	None	H [code length]
UCC/EAN 128	P	None	L [code length]
MSI/Plessey	O	None	None
Code 11	None	None	None

4.10 USB READER CONFIGURATION

The USB interface is compatible with:

Windows 98 (and later)	IBM POS for Windows
Mac OS 8.0 (and later)	4690 Operating System

USB Start-up

As with all USB devices, upon connection, the Host performs several checks by communicating with the USB device. During this phase the LED on the device blinks and normal operations are suspended. Two basic conditions must be met before the USB device is ready to read codes, the correct USB driver must be loaded and sufficient power must be supplied to the reader.

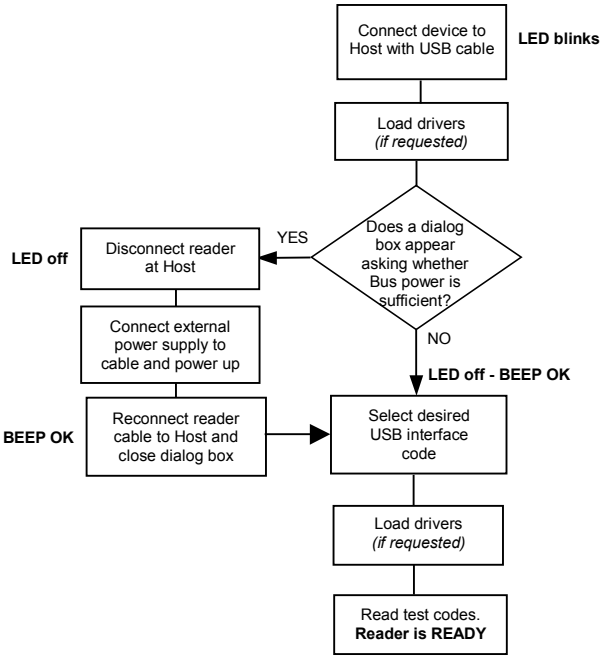
For all systems, the correct USB driver for the default USB-KBD interface is included in the Host Operating System and will either be loaded automatically or will be suggested by the O.S. and should therefore be selected from the dialog box (the first time only).

If the Host supplies sufficient power to the reader, the start-up phase ends correctly, the LED stops blinking and the reader emits the beep OK signal.

If the Host does not supply sufficient power to the reader, a dialog box will appear on the Host and the reader will be blocked (LED continues blinking). In this case, disconnect the USB device cable at the Host (LED stops blinking), connect and power-up an external supply to the USB device cable then reconnect the USB device cable to the Host and close the dialog box. The reader emits the beep OK signal. You can now read codes. At this point you can read the USB interface configuration code according to your application. Load drivers from the O.S. (if requested). When configuring the USB-COM interface, the relevant files and drivers must be installed from the USB Device Installation software which can be downloaded from the web page http://www.datalogic.com/services/support/.

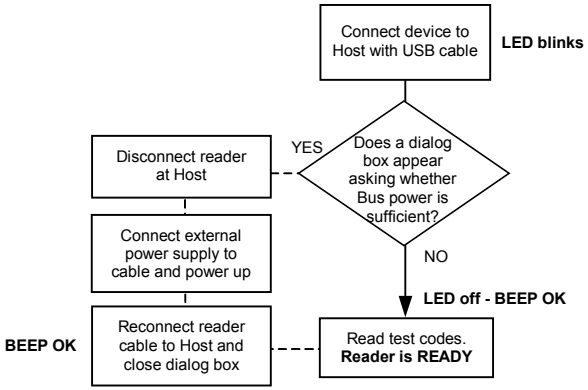
The reader is ready.

First Start-Up


Connect device to Host with USB cable
LED blinks
Load drivers (if requested)
Does a dialog box appear asking whether Bus power is sufficient?
YES
LED off
Disconnect reader at Host
Connect external power supply to cable and power up
NO
LED off - BEEP OK
BEEP OK
Reconnect reader cable to Host and close dialog box
Select desired USB interface code
Load drivers (if requested)
Read test codes. Reader is READY

Successive start-ups will automatically recognize the previously loaded drivers. If external power is used, verify that external power is already supplied.

Successive Start-Ups


Connect device to Host with USB cable
LED blinks
Does a dialog box appear asking whether Bus power is sufficient?
YES
Disconnect reader at Host
Connect external power supply to cable and power up
NO
LED off - BEEP OK
BEEP OK
Reconnect reader cable to Host and close dialog box
Read test codes. Reader is READY

4.11 FIRMWARE UPGRADES

Device firmware upgrades can be performed using the DL Sm@rtSet external Downloader utility tool from your PC either through RS232 or USB communications. The procedure for downloading is described in the DL Sm@rtSet User's Manual and in the Help window.

A special case occurs when using USB communications to upgrade devices without button/trigger.

Procedure: **For devices WITHOUT button/trigger**

① Launch the Downloader tool from the DL Sm@rtSet folder on your PC.

② Connect the device to the PC via USB interface.

③ Read the code given below to emulate the trigger press:

Trigger Press

The device will automatically be reset.

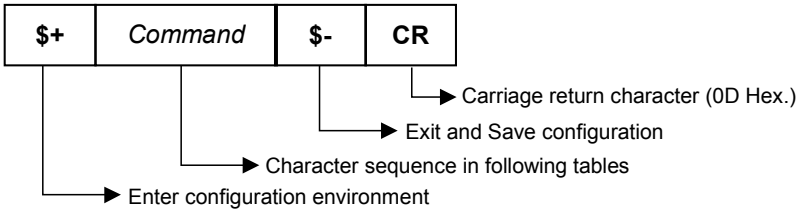
④ Proceed with the firmware upgrade (see the DL Sm@rtSet User's Manual for details).

A HOST CONFIGURATION STRINGS

In this section we provide a description of how to modify the device configuration using serial strings sent from the Host.

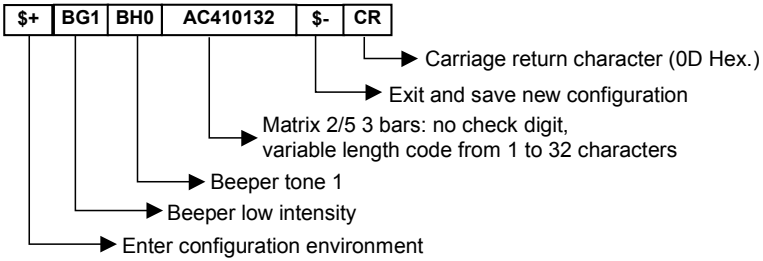
This method requires either the RS232 or USB-COM interface.

The device configuration can be changed by receiving commands from the Host through the serial interface. When this method is used, the programming sequence format is the following:



Example:

Multiple command programming sequence:



Each configuration parameter setting removes the condition previously active for that parameter.

NOTE

The device buffer can contain about 400 characters. If your programming string goes over this value, you must split it into separate groups and send each group after a delay of at least 3 seconds to give the reader time to empty the buffer and interpret the commands.

SERIAL CONFIGURATION STRINGS

ENTER/EXIT CONFIGURATION COMMANDS	
DESCRIPTION	**STRING**
Enter Configuration	**$+**
Exit and Save Configuration	**$-**
Restore Default	**$+$***
Transmit Software Release (not for PEN emulation)	**$+$!**
Transmit Configuration (not for PEN emulation)	**$+$&**

INTERFACE SELECTION			
DESCRIPTION			**STRING**
RS232	Standard		**CP0**
	ICL Mode		**CM0**
	Fujitsu		**CM1**
	Nixdorf Mode A		**CM2**
USB	USB-KBD		**UA03**
	USB-KBD-ALT-MODE		**UA04**
	USB-KBD-APPLE		**UA05**
	USB-COM		**UA02**
	USB-IBM-Table Top		**UA00**
	USB-IBM-Hand Held		**UA01**
WEDGE	for IBM AT		**CP500**
	for IBM Terminals: 31xx, 32xx, 34xx, 37xx; make-break keyboard		**CP501**
	for IBM Terminals: 31xx, 32xx, 34xx, 37xx; make-only keyboard		**CP502**
	Keyboard Type for IBM Terminals 31xx, 32xx, 34xx, 37xx	typewriter	**FK0**
		advanced	**FK1**
	for IBM XT		**CP503**
	for IBM Terminal 3153		**CP504**
	for IBM PC Notebook		**CP505**
	for IBM SURE1		**CP506**
	for IBM AT - ALT mode		**CP507**
	for IBM PC Notebook - ALT mode		**CP508**
	for Wyse Terminal - ANSI Keyboard		**CP509**
	for Wyse Terminal - PC Keyboard		**CP510**
	for Wyse Terminal - ASCII Keyboard		**CP511**
	for Wyse Terminal - VT220 style Keyboard		**CP514**
	for Digital Terminals VT2xx/3xx/4xx		**CP512**
	for Apple ADB Bus		**CP513**
IBM 46xx	4501 Protocol		**CP800**
	1520 Protocol		**CP801**
PEN EMULATION			**CP6**

RS232		
DESCRIPTION		**STRING**
Baud rate	300	**CD1**
	600	**CD2**
	1200	**CD3**
	2400	**CD4**
	4800	**CD5**
	9600	**CD6**
	19200	**CD7**
	38400	**CD8**
Parity	none	**CC0**
	even	**CC1**
	odd	**CC2**
Data bits	7	**CA0**
	8	**CA1**
	9	**CA2**
Stop bits	1	**CB0**
	2	**CB1**
Handshaking	disable	**CE0**
	RTS/CTS	**CE1**
	XON/XOFF	**CE2**
	RTS always ON	**CE3**
ACK/NACK Protocol	disable	**ER0**
	enable	**ER1**
FIFO	disable	**EC0**
	enable	**EC1**
Inter-character delay *(ms)*		**CK00 - CK99**
RX Timeout *(100 ms)*		**CL00 - CL99**
Serial Trigger Lock	disable	**CR0**
	enable	**CR1*ab***

a = Hex value of the ASCII character from **00** to **FE** enabling the device trigger;

b = Hex value of the ASCII character from **00** to **FE** disabling the device trigger;

USB		
DESCRIPTION		**STRING**
USB-COM		
Handshaking	disable	**CE0**
	RTS/CTS	**CE1**
	XON/XOFF	**CE2**
	RTS always ON	**CE3**
ACK/NACK Protocol	disable	**ER0**
	enable	**ER1**
FIFO	disable	**EC0**
	enable	**EC1**
Inter-character delay *(ms)*		**CK00 - CK99**
RX Timeout *(100 ms)*		**CL00 - CL99**
Serial Trigger Lock	disable	**CR0**
	enable	**CR1*ab***
USB-KBD		
Keyboard nationality (not for USB-KBD-ALT-MODE)	Belgian	**FJ7**
	English	**FJ4**
	French	**FJ2**
	German	**FJ3**
	Italian	**FJ1**
	Spanish	**FJ6**
	Swedish	**FJ5**
	USA	**FJ0**
	Japanese	**FJ8**
Delays	Inter-Character *(ms)*	**CK00 - CK99**
	Inter-Code *(s)*	**FG00 - FG99**
Control Character Emulation	CTRL +Shift + Key	**FO0**
	Ctrl + Key	**FO1**

WEDGE		
DESCRIPTION		**STRING**
Keyboard nationality	Belgian	**FJ7**
	English	**FJ4**
	French	**FJ2**
	German	**FJ3**
	Italian	**FJ1**
	Spanish	**FJ6**
	Swedish	**FJ5**
	USA	**FJ0**
	Japanese (IBM AT compatible only)	**FJ8**
Caps Lock	caps Lock ON	**FE1**
	caps Lock OFF	**FE0**
Caps Lock Auto-Recognition (IBM AT compatible only)	disable	**FP0**
	enable	**FP1**
Num Lock	Toggle Num Lock	**FL1**
	Num Lock Unchanged	**FL0**
Delays	Inter-Character *(ms)*	**CK00 - CK99**
	Inter-Code *(s)*	**FG00 - FG99**
Control Character Emulation	CTRL +Shift + Key	**FO0**
	Ctrl + Key	**FO1**

PEN		
DESCRIPTION		**STRING**
Operating mode	interpret (does not require **$+** or **$-**)	**$]**
	transparent (does not require **$+** or **$-**)	**$[**
Minimum output pulse	200µs	**DG0**
	400µs	**DG1**
	600µs	**DG2**
	800µs	**DG3**
	1 ms	**DG4**
	1.2 ms	**DG5**
Conversion to Code 39	disable conversion to Code 39	**DA0**
	enable conversion to Code 39	**DA1**
Output level	normal	**DD0**
	inverted	**DD1**
Idle level	normal	**DE0**
	inverted	**DE1**
Overflow	narrow overflow	**DH0**
	medium overflow	**DH1**
	wide overflow	**DH2**
Inter-Block Delay *(100 ms)*		**CK00-CK99**

DATA FORMAT		
NOT FOR PEN EMULATION INTERFACES		
DESCRIPTION		**STRING**
Code Identifier	disable	**EB0**
	Datalogic standard	**EB1**
	AIM standard	**EB2**
	Custom	**EB3**
Custom Code Identifier		**EH*abc***
Headers	no header	**EA00**
	one character	**EA01*x***
	two characters	**EA02*xx***
	three characters	**EA03*xxx***
	four characters	**EA04*xxxx***
	five characters	**EA05*xxxxx***
	six characters	**EA06*xxxxxx***
	seven characters	**EA07*xxxxxxx***
	eight characters	**EA08*xxxxxxxx***
Terminators	no terminator	**EA10**
	one character	**EA11*x***
	two characters	**EA12*xx***
	three characters	**EA13*xxx***
	four characters	**EA14*xxxx***
	five characters	**EA15*xxxxx***
	six characters	**EA16*xxxxxx***
	seven characters	**EA17*xxxxxxx***
	eight characters	**EA18*xxxxxxxx***

a = ASCII character.
b, ***c***, ***x*** = HEX values representing an ASCII character.

a = ASCII character of the DATALOGIC STANDARD Code Identifier from the table on page 39.

b = Hex value of the first Custom Code Identifier character from **00** to **FE**;
FF = disable Code Identifier

c = Hex value of the second Custom Code Identifier character from **00** to **FE**;
FF = disable second character of Custom Code Identifier

x = Hex value from **00** to **FE**

DATA FORMAT (continued)		
NOT FOR PEN EMULATION INTERFACES		
DESCRIPTION		**STRING**
Code Length Tx	not transmitted	**EE0**
	transmitted	**EE1**
	transmitted in 4-digit format	**EE2**
Field Adjustment	disabled	**EF0**
	right addition	**EF*a*0*d***
	left addition	**EF*a*1*d***
	right deletion	**EF*a*2*d***
	left deletion	**EF*a*3*d***
Field Adjustment Character		**EG*e***
Character Replacement	disable character replacement	**EO0**
	first character replacement	**EO1*afg***
	second character replacement	**EO2*afg***
	third character replacement	**EO3*afg***

a = ASCII character.
d = a number from the Hex/Numeric Table.
e, ***f, g*** = HEX values representing an ASCII character.

a = ASCII character of the DATALOGIC STANDARD Code Identifier from the table on page 39.

d = a number in the range **01 – 32** from the Hex/Numeric Table

e = Hex value from **00** to **FE**

f = Hex value of the character to be replaced from **00** to **FE**

g= Hex value of the new character to insert from **00** to **FE**
FF = replace with no new character (remove character)

POWER SAVE		
DESCRIPTION		**STRING**
Scan Rate	Quarter	**BT0**
	Half	**BT1**
	Maximum	**BT2**
Sleep State/USB Suspend	disable	**BQ0**
	enable	**BQ1**
Enter Sleep Timeout *(100 ms)*		**BR00-BR99**
Standby	enable	**BM0**
	disable	**BM1**

READING PARAMETERS		
DESCRIPTION		**STRING**
Hand-Held Operation	software trigger	**BK0**
	hardware trigger	**BK1**
	automatic	**BK2**
	always on	**BK3**
	hardware trigger ready	**BK4**
Stand Operation	software trigger	**BU1**
	hardware trigger	**BU3**
	automatic	**BU0**
	always on	**BU2**
Hardware Trigger Signal	trigger active level	**BA0**
	trigger active pulse	**BA1**
Trigger-off Timeout *(s)*		**BD00 - BD99**
FLASH ON *(100 ms)*		**BB001 - BB099**
FLASH OFF *(100 ms)*		**BB101 - BB199**
Reads per Cycle	one read	**BC0**
	multiple reads	**BC1**
Safety Time *(100 ms)*		**BE00 - BE99**
Beeper Intensity	beeper off	**BG0**
	low intensity	**BG1**
	medium intensity	**BG2**
	high intensity	**BG3**
Beeper Tone	tone 1	**BH0**
	tone 2	**BH1**
	tone 3	**BH2**
	tone 4	**BH3**
Beeper Type	monotone	**BJ0**
	bitonal	**BJ1**
Beeper Length	long	**BI0**
	short	**BI1**
Good Read Spot Duration	disable	**BV0**
	short	**BV1**
	medium	**BV2**
	long	**BV3**
Stand Recognition Beep	disable	**Ba0**
	enable	**Ba1**
Automatic Operation Aiming Light	disable	**Bb0**
	enable	**Bb1**
Aiming System	disable	**BX0**
	300 ms	**BX1**
	500 ms	**BX2**
	1 sec	**BX3**

DECODING PARAMETERS		
DESCRIPTION		**STRING**
Ink-spread	disable	**AX0**
	enable	**AX1**
Overflow control	disable	**AW1**
	enable	**AW0**
Interdigit control	disable	**AV0**
	enable	**AV1**
Decoding Safety	one read	**ED0**
	two reads	**ED1**
	three reads	**ED2**
	four reads	**ED3**
PuzzleSolver™	disable	**AU0**
	enable	**AU1**

CODE SELECTION			
DESCRIPTION			**STRING**
DISABLE ALL FAMILY CODES			**AZ0**
EAN/UPC	disable EAN/UPC family		**AA0**
	EAN 8/EAN 13/UPC A/UPC E	without ADD ON	**AA1**
		with ADD ON	**AA5**
		with and without ADD ON	**AA8**
	EAN 8/EAN 13	without ADD ON	**AA3**
		with ADD ON 2 ONLY	**AAK**
		with ADD ON 5 ONLY	**AAL**
		with ADD ON 2 AND 5	**AA6**
	UPC A/UPC E	without ADD ON	**AA4**
		with ADD ON 2 ONLY	**AAM**
		with ADD ON 5 ONLY	**AAN**
		with ADD ON 2 AND 5	**AA7**
	EAN 8 check digit transmission	disable	**AAG0**
		enable	**AAG1**
	EAN 13 check digit transmission	disable	**AAH0**
		enable	**AAH1**
	UPC A check digit transmission	disable	**AAI0**
		enable	**AAI1**
	UPC E check digit transmission	disable	**AAJ0**
		enable	**AAJ1**
	conversions	UPC E to UPC A	**AAA**
		UPC E to EAN 13	**AAB**
		UPC A to EAN 13	**AAC**
		EAN 8 to EAN 13	**AAD**

CODE SELECTION (continued)				
DESCRIPTION				**STRING**
	ISBN Conversion codes		enable ISBN	**AP1**
			enable ISSN	**AP2**
			enable ISBN and ISSN	**AP3**
			disable ISBN and ISSN	**AP0**
Code 39	disable Code 39 family			**AB0**
	Standard	no check digit control		**AB11**
		check digit control and transmission		**AB12**
		check digit control without transmission		**AB13**
	Full ASCII	no check digit control		**AB21**
		check digit control and transmission		**AB22**
		check digit control without transmission		**AB23**
	CIP 39			**AB3**
	Code 32			**AB4**
	code length			**AB*xxxx***
2/5	disable Code 2/5 family			**AC0**
	Interleaved 2/5	no check digit control		**AC11*xxxx***
		check digit control and transmission		**AC12*xxxx***
		check digit control without transmission		**AC13*xxxx***
	Normal 2/5 5 bars	no check digit control		**AC21*xxxx***
		check digit control and transmission		**AC22*xxxx***
		check digit control without transmission		**AC23*xxxx***
	Industrial 2/5 (IATA)	no check digit control		**AC31*xxxx***
		check digit control and transmission		**AC32*xxxx***
		check digit control without transmission		**AC33*xxxx***
	Matrix 2/5 3 bars	no check digit control		**AC41*xxxx***
		check digit control and transmission		**AC42*xxxx***
		check digit control without transmission		**AC43*xxxx***
	CIP/HR			**AC5**

xxxx = ASCII numbers that define the code length where:

- First 2 digits = minimum acceptable code length.
- Second 2 digits = maximum acceptable code length.

The minimum code length must always be less than or equal to the maximum. The maximum code lengths are **99** characters.

Examples:

0132 = variable length from 1 to 32 digits in the code.

1010 = 10 digit code length only.

CODE SELECTION (continued)				
DESCRIPTION				**STRING**
Codabar	disable Codabar family			**AD0**
	Standard	no start/stop character equality control nor transmission		**AD111**
		no start/stop character equality control but transmission		**AD112**
		start/stop character equality control but no transmission		**AD121**
		start/stop character equality control and transmission		**AD122**
	ABC Codabar	no start/stop character equality control but transmission		**AD212**
	Codabar ABC forced concatenation			**AD232**
	code length			**AD*xxxx***
	start/stop character case in transmission		lower case	**ADA0**
			upper case	**ADA1**
Code 128	disable Code 128 family			**AI0**
	enable Code 128 - control without transmission of check digit			**AI11**
	enable EAN 128 - control without transmission of check digit			**AI21**
	add GS before Code	disable		**EQ0**
		enable		**EQ1**
	ISBT 128	enable ISBT 128		**AI31**
	code length			**AIL*xxxx***
Code 93	disable Code 93 family			**AK0**
	enable Code 93 - control without transmission of check digit			**AK1**
MSI	disable the family			**AE0**
	no check			**AE1**
	MOD10 no tx			**AE2**
	MOD10 with tx			**AE3**
	MOD11-MOD10 no tx			**AE4**
	MOD11-MOD10 with tx			**AE5**
	MOD10-MOD10 no tx			**AE6**
	MOD10-MOD10 with tx			**AE7**

xxxx = ASCII numbers that define the code length where:

- First 2 digits = minimum acceptable code length.
- Second 2 digits = maximum acceptable code length.

The minimum code length must always be less than or equal to the maximum. The maximum code lengths are **99** characters.

Examples:
0132 = variable length from 1 to 32 digits in the code.
1010 = 10 digit code length only.

CODE SELECTION (continued)		
DESCRIPTION		**STRING**
Plessey	disable the family	**AF0**
	Standard no check	**AF11**
	Standard check - with tx	**AF12**
	Standard check - no tx	**AF13**
	Anker no check	**AF21**
	Anker check - with tx	**AF22**
	Anker check - no tx	**AF23**
Telepen	disable the family	**AL0**
	Numeric no check	**AL11**
	Numeric check - with tx	**AL12**
	Numeric check - no tx	**AL13**
	Alpha no check	**AL21**
	Alpha check - with tx	**AL22**
	Alpha check - no tx	**AL23**
Delta IBM	disable the family	**AH0**
	no check	**AH1**
	Type 1 check	**AH2**
	Type 2 check	**AH3**
Code 11	disable the family	**AG0**
	no check	**AG1**
	Type C with tx	**AG21**
	Type C no tx	**AG22**
	Type K with tx	**AG31**
	Type K no tx	**AG32**
	Type C and K with tx	**AG41**
	Type C and K no tx	**AG42**
Code 16K	disable	**AJ0**
	enable	**AJ1**
Code 49	disable	**AM0**
	enable	**AM1**
RSS Codes	disable the family	**AQ0**
	disable RSS Expanded Linear and Stacked	**AQ10**
	enable RSS Expanded Linear and Stacked	**AQ11**
	disable RSS Limited	**AQ20**
	enable RSS Limited	**AQ21**
	disable RSS 14 Linear and Stacked	**AQ30**
	enable RSS 14 Linear and Stacked	**AQ31**

B CODE IDENTIFIER TABLE

2/5 Interleaved

2/5 normal 5 bars

EAN 8

UPC A

EAN 8 with 2 ADD ON

EAN 13 with 2 ADD ON

UPC A with 2 ADD ON

2/5 Industrial

2/5 matrix 3 bars

EAN 13

UPC E

EAN 8 with 5 ADD ON

EAN 13 with 5 ADD ON

UPC A with 5 ADD ON

UPC E with 5 ADD ON

Code 39 Full ASCII

ABC CODABAR

EAN 128

CIP/39

Code 32

UPC E with 2 ADD ON

Code 39

CODABAR

Code 128

Code 93

CIP/HR

ISBT 128

MSI

Plessey Standard

Telepen

Code 11

RSS Expanded Linear and Stacked

RSS 14 Linear and Stacked

Plessey Anker

Delta IBM

Code 16K

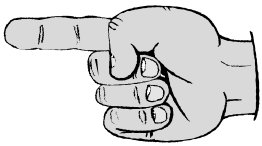
Code 49

RSS Limited

APPENDIX C HEX AND NUMERIC TABLE

OPEN THIS PAGE TO READ THE DESIRED

HEX AND NUMERIC SELECTIONS



CHARACTER TO HEX CONVERSION TABLE					
char	**hex**	**char**	**hex**	**char**	**hex**
NUL	**00**	*	**2A**	U	**55**
SOH	**01**	+	**2B**	V	**56**
STX	**02**	,	**2C**	W	**57**
ETX	**03**	-	**2D**	X	**58**
EOT	**04**	.	**2E**	Y	**59**
ENQ	**05**	/	**2F**	Z	**5A**
ACK	**06**	0	**30**	[	**5B**
BEL	**07**	1	**31**	\	**5C**
BS	**08**	2	**32**	]	**5D**
HT	**09**	3	**33**	^	**5E**
LF	**0A**	4	**34**	_	**5F**
VT	**0B**	5	**35**	`	**60**
FF	**0C**	6	**36**	a	**61**
CR	**0D**	7	**37**	b	**62**
SO	**0E**	8	**38**	c	**63**
SI	**0F**	9	**39**	d	**64**
DLE	**10**	:	**3A**	e	**65**
DC1	**11**	;	**3B**	f	**66**
DC2	**12**	<	**3C**	g	**67**
DC3	**13**	=	**3D**	h	**68**
DC4	**14**	>	**3E**	i	**69**
NAK	**15**	?	**3F**	j	**6A**
SYN	**16**	@	**40**	k	**6B**
ETB	**17**	A	**41**	l	**6C**
CAN	**18**	B	**42**	m	**6D**
EM	**19**	C	**43**	n	**6E**
SUB	**1A**	D	**44**	o	**6F**
ESC	**1B**	E	**45**	p	**70**
FS	**1C**	F	**46**	q	**71**
GS	**1D**	G	**47**	r	**72**
RS	**1E**	H	**48**	s	**73**
US	**1F**	I	**49**	t	**74**
SPACE	**20**	J	**4A**	u	**75**
!	**21**	K	**4B**	v	**76**
"	**22**	L	**4C**	w	**77**
#	**23**	M	**4D**	x	**78**
$	**24**	N	**4E**	y	**79**
%	**25**	O	**4F**	z	**7A**
&	**26**	P	**50**	{	**7B**
'	**27**	Q	**51**	|	**7C**
(	**28**	R	**52**	}	**7D**
)	**29**	S	**53**	~	**7E**
		T	**54**	DEL	**7F**

HEX / NUMERIC TABLE

0

1

2

3

4

5

6

7

8

9

A

B

C

D

E

F

Backspace

Cancels an incomplete configuration sequence

90ACC1877